UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,267	09/30/2003	Yona Perets	P-6064-US	2064

49444 7590 12/29/2006	EXAMINER	
PEARL COHEN ZEDEK LATZER, LLP	LEE, SIU M	
1500 BROADWAY, 12TH FLOOR		
NEW YORK, NY 10036	ART UNIT	PAPER NUMBER
	2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/29/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	10/673,267	PERETS ET AL.
	Examiner	Art Unit	
	Siu M. Lee	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>30 September 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-36</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-36</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>30 September 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>3/17/2005., 9/30/2003</u>

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   Claims 2, 4, 5, 6, 14, 15, 29, 31 are objected to because of the following informalities:

(1) Regarding claim 2, line 2, the examiner suggests to delete "able".

(2) Regarding claim 4, line 1, the examiner suggests to change from "controller is able to control" to ---controller controls---.

(3) Regarding claim 5, line 1-2, the examiner suggests to change from "controller is able to activate" to ---controller activates---.

(4) Regarding claim 6, line 1-2, the examiner suggests to change from "controller is able to sequentially activate" to ---controller sequentially activates---.

(5) Regarding claim 14, line 2, delete "able"

(6) Regarding claim 15, line 2, the examiner suggests to delete "able".

(7) Regarding claim 29, line 2, the examiner suggests to delete "able".

(8) Regarding claim 31, line 4-5, the examiner suggests to change from "controller is able to control" to ---controller controls---.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3.   Claim 5 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention.

Claim 5 recites, "said controller is able to activate at least some of said two or

more sub-detectors substantially simultaneously". That means the claimed controller is

able to activate at least some of said two sub-detectors substantially simultaneously.

Since there are only two sub-detectors, "some of the two" means one. If only one of the

2 sub-detectors is being turned on, the limitation "substantially simultaneously" will be

contradicting because when there is only one sub-detector to turn on, it cannot be

"substantially simultaneously".

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 1-7, 10, 14-17, 20, 22, 24, 25, 27-32 are rejected under 35 U.S.C. 102(e)

as being anticipated by Fulghum et al. (US 6,580,930 B1).

(1) Regarding claim 1:

Fulghum et al. discloses an apparatus (receiver 200 in figure 2) comprising a

multi-algorithm detector (less complex detector 210 and more complex detector 215 in

figure 2) to detect a transmitted signal according to a detection algorithm selected from

two or more detection algorithms based on a predetermined selection criterion

(comparing the bit error rate to the bit error rate threshold value) (column 4, lines 29-32

and 34-39).

(2) Regarding claim 2:

Fulghum et al. discloses an apparatus wherein said detector comprises two or

more sub-detectors (less complex detector 210 and more complex detector 215 in

figure 2) able to detect said transmitted signal according to said two or more detection

algorithms (the less complex detector and more complex detector detected symbols at

locations corresponding to the known symbols with predetermined symbol values,

column 4, lines 15-27), respectively.

(3) Regarding claim 3:

Fulghum et al. discloses an apparatus wherein said detector comprises a

controller (controller 235 in figure 2) to control the selection of said detection algorithm

according to outputs of said sub-detectors (controller 235 controls switch 240 to supply

power to either less complex detector 210 or more complex detector 215 depending on

the bit error rate, column 4, lines 37-39).

(4) Regarding claim 4:

Fulghum et al. discloses an apparatus wherein said controller is able to control

activation of one or more of said at two or more sub-detectors (controller 235 can

control switch 240 to activate less complex detector 210 or more complex detector 215

depending on the bit error rate).

(5) Regarding claim 5 (base on the 112 rejection above, the examiner interpreted

the claim as "an apparatus wherein sad controller is able to activate at least some of

said two or more sub-detectors"):

Fulghum et al. discloses an apparatus wherein said controller is able to activate

at least some of said two or more sub-detectors (controller 235 can control switch 240

to activate less complex detector 210 or more complex detector 215 depending on the

bit error rate).

(6) Regarding claim 6:

Fulghum et al. discloses an apparatus wherein said controller is able to

sequentially activate at least some of said two or more sub-detectors according to a

preset sequence (the controller 235 in figure 2 will always activate the less complex

detector 210 in figure 2 first and if the BER is above the BER threshold value, then the

controller 235 will activate the more complex detector 215) (column 4, lines 27-39).

(7) Regarding claim 7:

Fulghum et al. discloses an apparatus wherein said controller comprises a

calculator to calculate a quality metric (to determine the bit error rate for the known

symbols) corresponding to one or more of said sub-detectors (bit error detector 230 in

figure 2 determine the bit error rate (BER) for the known symbols in one or more field of

the received signal) (column 4, lines 22-27).

(8) Regarding claim 10:

Fulghum et al. discloses an apparatus having a mode of operation wherein said criterion relates to a preset minimum quality value (comparing with the BER threshold value in block 270 in figure 2) (column 4, lines 29-33).

(9) Regarding claim 14:

Fulghum et al. discloses a wireless communications device comprising a transceiver (Time Division Multiple Access System including 2 base stations) able to send and receive signals (column 14, lines 44-51); a multi-algorithm detector (less complex detector 210, more complex detector 215, bit error detector 230 and controller 235 in figure 2) to detect a transmitted signal according to a detection algorithm selected from two or more detection algorithms (less complex detector and more complex detector) based on a predetermined selection criterion (comparison to the BER threshold in bit error detector 230 in figure 2) (column 4, lines 29-39).

(10) Regarding claim 15:

Fulghum et al. discloses a device wherein said detector comprises two or more sub-detectors (less complex detector 210 and more complex detector 215 in figure 2) able to detect said transmitted signal according to said two or more detection algorithms (the less complex detector and more complex detector detected symbols at locations corresponding to the known symbols with predetermined symbol values, column 4, lines 15-27), respectively.

(11) Regarding claim 16:

Fulghum et al. discloses a device wherein said detector comprises a controller (controller 235 in figure 2) to control the selection of said detection algorithm according

to outputs of said sub-detectors (controller 235 controls switch 240 to supply power to either less complex detector 210 or more complex detector 215 depending on the bit error rate of the output of the two detectors, column 4, lines 37-39).

(12) Regarding claim 17:

Fulghum et al. discloses an apparatus wherein said controller comprises a calculator (bit error detector 230 in figure 2) to calculate a quality metric (to determine the bit error rate for the known symbols) corresponding to one or more of said sub-detectors (bit error detector 230 in figure 2 determine the bit error rate (BER) for the known symbols in one or more field of the received signal) (column 4, lines 22-27).

(13) Regarding claim 20:

Fulghum et al. discloses a device having a mode of operation wherein said criterion relates to a preset minimum quality value (comparing with the BER threshold value (minimum quality) in block 270 in figure 2) (column 4, lines 29-33).

(14) Regarding claim 22:

Fulghum et al. discloses a method (figure 3) selecting a signal-detection algorithm from two or more signal-detection algorithms (selection of less complex detector 210 or more complex detector 215) according to a predetermined criterion (comparing the bit error rate to the bit error rate threshold value) (column 4, lines 29-32 and 34-39) (step 270 in figure 3, column 4, lines 29-39).

(15) Regarding claim 24:

Fulghum et al. discloses a method comprising sequentially calculating according to a predetermined sequence (first turn on the less complex detector and then the more

complex detector) a quality metric (the bit error rate BER) corresponding to said two or

more signal-detection algorithms (when the BER of the less complex detector is higher

than the BER threshold, then the more complex detector is turn on and process the

incoming signal and the BER of the more complex detector is calculate, column 4, lines

34-39), wherein said selected signal-detection algorithm corresponds to a calculated

quality metric (bit error rate BER) having a value higher than a preset minimum-quality

value (BER threshold value) (column 4, lines 29-39).

(16) Regarding claim 25:

Fulghum et al. discloses an article comprising a storage medium having stored

thereon instructions that (software embodiment running on one or more programmable

controllers, column 13, lines 52-58), when executed by a processing platform, result in:

selecting a signal-detection algorithm from two or more signal-detection algorithms

according to a predetermined criterion (column 13, lies 52-58).

(17) Regarding claim 27:

Fulghum et al. discloses a method comprising sequentially calculating according

to a predetermined sequence (first turn on the less complex detector and then the more

complex detector) a quality metric (the bit error rate BER) corresponding to said two or

more signal-detection algorithms (when the BER of the less complex detector is higher

than the BER threshold, then the more complex detector is turn on and process the

incoming signal and the BER of the more complex detector is calculate, column 4, lines

34-39), wherein said selected signal-detection algorithm corresponds to a calculated

quality metric (bit error rate BER) having a value higher than a preset minimum-quality

value (BER threshold value) (column 4, lines 29-39).

(18) Regarding claim 28:

Fulghum et al. discloses a communication system comprising a first

communication device to transmit a signal through a communication channel (traffic

channel) (column 14, lines 44-51); and a second communication device to receive said

signal (column 14, lines 20), said second communication device comprising a multi-

algorithm detector to detect said transmitted signal according to a detection algorithm

selected from two or more detection algorithms (less complex detector 210 and more

complex detector 215 in figure 2) based on a predetermined selection criterion

(comparing BER with the BER threshold value) (column 14, lines 21-35).

(19) Regarding claim 29:

Fulghum et al. discloses a system wherein said detector comprises two or more

sub-detectors (less complex detector 210 and more complex detector 215 in figure 2)

able to detect said transmitted signal according to said two or more detection algorithms

(differential detector and an equalizer, column 13, lines 61-63), respectively.

(20) Regarding claim 30:

Fulghum et al. discloses a system wherein said detector comprises a controller

(controller 235 in figure 2) to control the selection of said detection algorithm according

to outputs of said sub-detectors (controller 235 controls switch 240 to supply power to

either less complex detector 210 or more complex detector 215 depending on the bit

error rate of the output of the detectors, column 4, lines 37-39).

(21) Regarding claim 31:

Fulghum et al. discloses a system wherein said controller is able to control

activation of one or more of said at two or more sub-detectors (controller 235 can

control switch 240 to activate less complex detector 210 or more complex detector 215

depending on the bit error rate).

(22) Regarding claim 32:

Fulghum et al. discloses an apparatus wherein said controller comprises a

calculator to calculate a quality metric (to determine the bit error rate for the known

symbols) corresponding to one or more of said sub-detectors (bit error detector 230 in

figure 2 determine the bit error rate (BER) for the known symbols in one or more field of

the received signal) (column 4, lines 22-27).

3.   Claims 11, 23, 26, are rejected under 35 U.S.C. 102(e) as being anticipated by

Yang (US 6,763,074 B1).

(1) Regarding claims 11:

Yang discloses a demodulation system with multiple operating modes comprising

a multi-algorithm detector (detector 102(1) to detector 102(n) in figure 17, column 10,

lines 57-65) to detect a transmitted signal according to a detection algorithm selected

from two or more detection algorithms based on a predetermined selection criterion

(column 10, line 65-column 11, line 15) and having a mode of operation, wherein said

criterion relates to a highest quality metric of two or more quality metrics corresponding

to said detection algorithms (column 11, lines 31-34).

(2) Regarding claims 23 and 26:

Yang discloses a demodulation system with multiple operating modes comprising

selecting a signal-detection algorithm from two or more signal-detection algorithms

according to a predetermined criterion (column 11, lines 31-34) and calculating two or

more quality metrics corresponding to said two or more signal-detection algorithms,

respectively (signal quality estimator 108(1) to 108(n), column 10,lines 65-67); and

selecting from the two or more signal-detection algorithms a signal-detection algorithm

corresponding to a highest quality metric of said calculated metrics (column 11, lines

31-34).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 8, 18 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Fulghum et al. (US 6,580,930 B1) in view of Acker (US 4,335,361).

Fulghum et al. discloses all the subject matter except said quality metric

comprises a quality metric selected from the group consisting of a signal to noise ratio,

a log likelihood ratio, and a mean square error. Fulghum et al. discloses an apparatus

wherein said quality metric comprises a quality metric of the bit error rate (BER) (column

4, lines 18-27) which is inversely proportion to the signal to noise ratio.

However, Acker discloses a calculation method between the bit error rate and the signal to noise ratio (column 3, lines 45-50 and 62-65 and column 4, lines 21-30).

It is desirable to use the SNR to represent the signal degradation because SNR is a clearer indicator for signal degradation (column 4, lines 37-39 and 45-48). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the quality metric of the system of Fulghum et al. with the signal to noise ratio as taught by Acker simplify the system.

6.   Claims 12 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fulghum et al. (US 6,580,930 B1) in view of Wong-Lam et al. (US 5,487,085).

Regarding claims 12 and 35, Fulghum et al. discloses all the subject matter and that the more complex detector can be an equalizer (column 13, lines 62-63) except Fulghum et al. does not explicitly discloses one or more of said detection algorithms comprises a minimum mean square error algorithm.

However, Wong-Lam et al. discloses a minimum mean square error block equalizer that detects the data (paragraph 0052, lines 4-7).

It is desirable to use a minimum mean square error algorithm in an equalizer because the computing algorithm on which they are based can be carried out very quickly (paragraph 0052, lines 9-11). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Wong-Lam et al. in the system and method of Fulghum et al. to improve the speed of the system.

7.   Claims 13 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fulghum et al. (US 6,580,930 B1) in view of Zak et al. (US 6,084,926).

Regarding claim 13 and 36, Fulghum et al. discloses all the subject matter and that the more complex detector can be an equalizer (column 13, lines 62-63) except Fulghum et al. does not explicitly discloses one or more of said detection algorithms comprises a maximal likelihood sequence estimation algorithm.

However, Zak et al. discloses a method and system for demodulating radio signals that comprises a maximum likelihood sequence estimator (maximum likelihood sequence estimator 26 in figure 1, column 3, lines 12-18).

It is desirable to use a maximal likelihood sequence estimation algorithm in an equalizer because it is optimized for demodulating time-dispersive radio signals. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Zak et al. in the method and system of Fulghum et al. to improve the efficiency of the system.

8.   Claims 9, 19, 21, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fulghum et al. (US 6,580,930 B1) in view of Yang (US 6,763,074 B1).

(1) Regarding claim 9, 19 and 34:

Fulghum et al. discloses all the subject matter except wherein said controller comprises a max-detector to detect a highest quality metric of two or more quality metrics corresponding to two or more of said sub-detectors, respectively.

However, Yang discloses a demodulation system with multiple operating modes comprising a controller (selector 112 in figure 17) comprises a max-detector to detect a highest quality metric of two or more quality metrics corresponding to two or more of said sub-detectors, respectively (selector 112 selects one of the detector based on the performance metrics, column 11, lines 31-34).

It is desirable to have the controller comprises a max-detector to detect a highest quality metric of two or more quality metrics corresponding to two or more of said sub-detectors, respectively because it enable the selector to chose the detector that can better handle a particular form of interference better (column 10, lines 57-59). Therefore, it would have bee obvious to one of ordinary skill in the art at the time of invention to combine the teaching of Yang with the system of Fulghum et al. to improve the performance of the system.

(2) Regarding claim 21:

Fulghum et al., discloses all the subject matter as discussed above except the device having a mode of operation, wherein said criterion relates to a highest quality metric of two or more quality metrics corresponding to said detection algorithms.

However, Yang discloses a demodulation system having a mode of operation, wherein said criterion relates to a highest quality metric of two or more quality metrics corresponding to said detection algorithms (column 11, lines 31-34).

It is desirable for the device to have a mode of operation, wherein said criterion relates to a highest quality metric of two or more quality metrics corresponding to said detection algorithms because it enable the selector to chose the detector that can better

handle a particular form of interference better (column 10, lines 57-59). Therefore, it would have bee obvious to one of ordinary skill in the art at the time of invention to combine the teaching of Yang with the system of Fulghum et al. to improve the performance of the system.

Conclusion

9.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kurihara (US 6,272,116 B1) discloses a power saving device. Khayrallah (US 5,848,106) discloses a receiver decoder circuitry, and associated method, for decoding an encoded signal. Abe (US 5,770,927) discloses a method and apparatus for distinguishing control channel from traffic channels. Bottomley et al. (US 6,333,953 B1) discloses a system and method for selecting an appropriate detection technique in a radiocommunication system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Siu M. Lee whose telephone number is (571) 270-1083. The examiner can normally be reached on Mon-Fri, 7:30-4:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Siu M. Lee
12/20/2006

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER